

FORSYTH RESERVOIR



Introduction

Forsyth Reservoir is northwest of Loa at the base of the Fish Lake Mountains. It is an intermediate-sized impoundment of a stream valley. In recent years, whirling disease has spread from a fish hatchery into the Fremont River system. Much of the system was treated to exterminate all fishes, and restocked with centrarchids. In

several years, the system will be restocked with trout.

The reservoir was created in 1922 by the construction of an earth-fill dam. The reservoir shoreline is 60% owned by the Fish lake National Forest and 40% privately owned (much of the north end of the reservoir). Public access is unrestricted. Water is consumed for agricultural uses, but also used for recreation and coldwater aquatic habitat. Water use is not expected to change in the foreseeable future.

Characteristics and Morphometry	
Lake elevation (meters / feet)	2,435 / 7,989
Surface area (hectares / acres)	64 / 158
Watershed area (hectares / acres)	19,374 / 47,872
Volume (m ³ / acre-feet)	
capacity	7,111,139 / 5,765
conservation pool	none
Annual inflow (m ³ / acre-feet)	
Retention time (years)	
Drawdown (m ³ / acre-feet)	
Depth (meters / feet)	
maximum	24 / 80
mean	8 / 26
Length (km / miles)	2.1 / 1.3
Width (km / miles)	0.5 / 0.3
Shoreline (km / miles)	5.5 / 3.4

Location	
County	Sevier
Longitude / Latitude	111 31 53 / 38 31 40
USGS Map	Forsyth Reservoir 1987
DeLorme Atlas	Page 27, A-6
Cataloging Unit	Fremont River (14070003)

Recreation

Forsyth Reservoir is accessible from U-72. From U-24 in the Loa area, go north on U-72 to Fremont Town and

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continue north for seven more miles. The reservoir is 1/2 mile west of the highway. The north arm is accessible from FS-018, and the south end from several unpaved roads opposite the FS-206 turnoff. From the north, Forsyth Reservoir is 23 miles south of I-70 on U-72.

The lake offers fishing, boating and primitive camping. Recreational facilities include an unimproved public boat ramp and unimproved campsites. Pack out all of your trash and dispose of human waste in an appropriate manner.

The nearest campground, Elkhorn, is located on the north slope of Thousand Lake Mountain, 7 miles east of Forsyth Reservoir. Go east of FS-206 (the road to Cathedral Valley in Capitol Reef N.P.) from its junction with U-72 for 7 miles, continuing on FS-206 after FS-022 to Cathedral Valley branches to the left. The campground has 6 campsites, vault toilets, and picnic facilities. No fees are charged.

The Inn, an RV park, offers modern facilities in the town of Fremont, 7 miles to the south.

Watershed Description

The reservoir is in an area of rolling ridges and valleys characteristic of the Fish Lake Plateau. U M Creek extends up a long, forested valley to the northwest and East and West Tidwell Canyons to the north. The area around the reservoir is forested with relatively shallow slopes.

The watershed high point, Mount Marvine, is 3,581 m (11,610 ft) above sea level, thereby developing a complex slope of 6.4% to the reservoir. Inflows are Short Creek and U M Creek. The average stream gradient above the reservoir is 2.3% (120 feet per mile). The outflow is U M Creek.

The watershed is composed of high mountains and mountain valleys. The soil is largely of volcanic origin with moderate permeability and moderately slow erosion and runoff. Soil associations are listed in Appendix III.

The vegetation communities are comprised of pine, aspen, mountain mahogany, pinyon-juniper and sage-grass. The watershed receives 41 - 76 cm (16 - 30 inches) of precipitation annually with a frost-free season of 80 - 100 days at the reservoir.

Land use is 95% multiple use land in the Fish lake National Forest, the major use of which is livestock grazing, recreation, and timber harvesting. The remaining 5% is private and State holdings within the forest, which are used primarily for grazing. Land uses have resulted in heavy runoff and substantial soil erosion.

Limnological Assessment

The water quality of Forsyth Reservoir is good. It is considered to be moderately hard with a hardness concentration range from 85-102 mg/L (CaCO₃). The only

Limnological Data

Data averaged from STORET sites: 595595, 595596

Surface Data	1980	1990	1992
Trophic Status	H	H	E
Chlorophyll TSI	-	61.65	59.59
Secchi Depth TSI	61.52	54.16	46.23
Phosphorous TSI	82.57	69.82	52.46
Average TSI	72.04	61.88	52.76
Chlorophyll <i>a</i> (ug/L)	-	23.7	19.2
Transparency (m)	0.9	1.5	2.6
Total Phosphorous (ug/L)	230	95	29
pH	8.1	8.5	9.1
Total Susp. Solids (mg/L)	5	3.9	<3
Total Volatile Solids (mg/L)	-	-	2
Total Residual Solids (mg/L)	-	-	2
Temperature (°C / °f)	19/66	17/63	18/64
Conductivity (umhos.cm)	175	204	179

Water Column Data

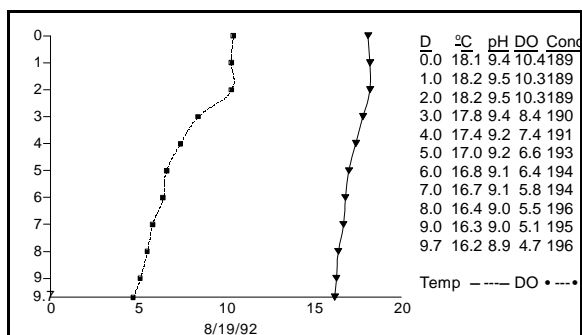
Ammonia (mg/L)	0.48	0.12	<0.05
Nitrate/Nitrite (mg/L)	0.39	0.21	<0.02
Hardness (mg/L)	83	96	89
Alkalinity (mg/L)	85	102	95
Silica (mg/L)	22	-	22.4
Total Phosphorus (ug/L)	118.5	87.0	41.0

Miscellaneous Data

Limiting Nutrient	N	N	N
DO (Mg/l) at 75% depth	0.2	3.5	5.7
Stratification (m)	2-5	NO	NO
Depth at Deepest Site (m)	17	5.3	9.7

parameter that has exceeded State water quality standards for defined beneficial uses is phosphorus. The average concentration of total phosphorus in the water column in 1980, 1990 and 1992 was 118.5, 87 and 41. All are well over the recommended pollution indicator for phosphorus of 25 ug/L. The phosphorus concentration near the bottom of the lake in July, 1990 exceeded the State pollution indicator with a value of 139 ug/L. Dissolved oxygen concentrations in late summer substantiate with a general decline in dissolved oxygen concentrations the fact that water quality impairments do exist. The reservoir is characterized as a phosphorus limited system. TSI values indicate the reservoir is hypereutrophic except for 1992 when the reservoir was classified as eutrophic. The reservoir typically stratifies if sufficient depth is present. The 1980 summer profile indicates that a thermocline developed at the depth of 2-5 meters with evidence of severe depletions of dissolved oxygen below 5 meters. Although in early summer in 1992 the lake was stratified with a general decline in dissolved oxygen concentrations occurring the profile in August,

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1992 depicts uniform type conditions typical of a well mixed system. It should be noted at the time there was a maximum depth of under 10 meters.

Historically, the DWR has stocked the reservoir annually with 7,000 fingerling rainbow trout and 3,000 fingerling brook trout. In 1991, the trout became infected with whirling disease, and the reservoir was treated with rotenone in 1992. It has been stocked with wipers, a cross between white bass (*Morone chrysops*) and striped bass (*Morone saxatilis*) rather than trout until the late 1990's to allow the disease to become extinct.

The reservoir was chemically treated by the DWR to control rough fish competition in 1959 as well as in 1992.

Phytoplankton in the euphotic zone include the following taxa (in order of dominance)

Species	Cell Volume (mm ³ /liter)	% Density By Volume
<i>Gloeotrichia echinulata</i>	222.400	94.80
<i>Aphanizomenon flos-aquae</i>	6.1	2.7
<i>Anabaena spiroides</i>		
var. crassa	5.782	2.46
<i>Stephanodiscus niagarae</i>	0.1	7.6
Pennate diatoms	0.100	0.04
<i>Euglena sp.</i>	0.017	0.01
Total	234.601	
Shannon-Weaver [H']	0.25	
Species Evenness	0.14	
Species Richness [d]	0.19	

As observed the phytoplankton community is dominated by primarily by blue-green algae indicative of fairly poor water quality.

Pollution Assessment

Nonpoint pollution sources are grazing, logging, and recreation.

During the summer, 670 head of cattle graze in the

watershed and around the reservoir.

There are several active timber sales in the Sheep Valley area in 1992, with 1,000,000 board feet of aspen being removed from a windstorm area.

Information

Management Agencies

Fishlake National Forest	896-9233
Loa Ranger District	836-2811
Six County Government Organization	896-9222
Division of Wildlife Resources	538-4700
Division of Water Quality	538-6146

Recreation

Panoramaland Travel Region (Richfield)	896-9222
River Inn RV Park (Fremont Town)	836-2715

Reservoir Administrators

Fremont Irrigation Company	836-2843
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There are no point pollution sources in the watershed.

Beneficial Use Classification

The state beneficial use classifications include: boating and similar recreation (excluding swimming) (2B), cold water game fish and organisms in their food chain (3A) and agricultural uses (4).

